



Maricopa County Air Quality Department

Phone: 602-506-6010

Email: AQmail@maricopa.gov

Maricopa.gov/AQ

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Permitting Handbook



Maricopa County Air Quality Department

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Introduction

The Maricopa County Air Quality Department (MCAQD) has a staff of about 138 employees including managers, inspectors, engineers, specialists, and support staff. The MCAQD is divided into six divisions: Director's Office, Planning and Analysis, Permitting, Compliance and Enforcement, Air Monitoring, and Travel Reduction and Outreach (which includes the Office of Business Assistance). Additionally, MCAQD's Ombudsman acts as an independent advocate for the needs of smaller sources.

The Permitting Division is responsible for implementing industrial source control programs as specifically required by the Clean Air Act and Arizona statute.

Each major pollution source must have a Title V operating permit that specifies its compliance requirements. The permits are for a fixed term of not more than five years and require the collection of fees from permittees to cover program costs. The U.S. Environmental Protection Agency (EPA) can review, require revisions, or object to the issuance of Title V permits.

The Permitting Division processes applications for dust, open burning, general, Non-Title V, and Title V permits as well as asbestos notifications, subcontractor registrations, and vapor recovery decals. In Fiscal Year 2020, the Permitting Division completed 412 Non-Title V permit actions and 10 Title V permit actions, issued 3,678 dust control permits and 886 General permits, and processed 874 asbestos notifications and 3,157 subcontractor registrations. Maricopa County currently has 32 Title-V permit holders, 1,235 Non-Title V permit holders, and 2,832 sources with an authority to operate under a General permit.

Other permit-related functions within this division include source impact dispersion modeling; source emissions testing acceptance and oversight; continuous monitoring system performance verification; and on-site source inspections. These activities ensure that emission sources are either complying with standards or are on a schedule for compliance by a specific date.

About this Handbook

The purpose of the Permitting Handbook is to provide a practical guide to applying for and complying with an air quality permit.

Disclaimer

The contents of the Permitting Handbook should not be viewed as the definite statement of rule or regulation and how to achieve compliance. Where the clear language of a rule or regulation conflicts with this handbook, the rule or regulation will prevail.

The user of this handbook should clearly understand that the discussion contained in this document is not binding. This handbook is not intended to serve as an alternative to a rule or regulation.

Section One – Selecting BACT and RACT

This section provides guidance for the selection of Best Available Control Technology (BACT) and Reasonably Available Control Technology (RACT).

Under the U.S. Environmental Protection Agency's (EPA's) New Source Review (NSR) program, if an owner or operator of a source is planning to build a new plant or modify an existing plant such that air pollution emissions will increase by a significant amount, then the owner or operator must obtain an NSR permit.

NSR permit conditions include requirements that the source minimize air pollution emissions by changing the process to prevent air pollution and/or installing air pollution control equipment. The terms "BACT" and "RACT" are acronyms for different program requirements under the NSR program.

There are seven rules in the Maricopa County Air Pollution Control Regulations that address NSR. Rule 241 (Minor New Source Review (NSR)) is one of those rules; it includes provisions and requirements for BACT and RACT for minor sources that are either new sources or modifications to existing sources of air pollution.

A **minor source** is a source that emits less than or has the potential to emit less than 100 tons per year of any regulated air pollutant or less than 70 tons per year of particulate matter less than or equal to 10 microns (PM₁₀).

Potential to emit (PTE) is the maximum capacity of a stationary source to emit pollutants, excluding secondary emissions, under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design, if the limitation or the effect it would have on emissions is legally and practically enforceable by any rule, ordinance, order, or permit adopted or issued under A.R.S. Title 49, Chapter 3, or the state implementation plan.

[Maricopa County Air Pollution Control Regulations Rule 100-General Provisions and Definitions]

PTE may take the following into account:

1. A RACT/BACT controlled emission level; or
2. An emission level based on the use of a control device that is either part of the design or installed as an add-on control of the subject emission source, provided the requirement for the use of such control device and the effect on the reduction of emissions are incorporated into an enforceable permit condition; or
3. An emission level based on restrictions, such as physical, material, production, and/or operational limitations that are incorporated into the permit as enforceable permit conditions.

A **regulated air pollutant** is any of the following:

1. Any conventional air pollutant, which is any pollutant for which the EPA Administrator has promulgated a primary or secondary national ambient air quality standard, including precursors to such pollutants (i.e., carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than or equal to 2.5 microns (PM_{2.5}), PM₁₀, and sulfur dioxide).
2. Any air contaminant that is subject to a standard promulgated under Section 111 (Standards of Performance for New Stationary Sources) of the Clean Air Act or under Section 112 (National Emission Standards for Hazardous Air Pollutants) of the Clean Air Act.
3. Any Class I or II substance listed in Section 602 (Stratospheric Ozone Protection; Listing of Class I and Class II Substances) of the Clean Air Act.
4. For the purpose of this definition, greenhouse gases shall not be considered a regulated air pollutant.
[Maricopa County Air Pollution Control Regulations Rule 100-General Provisions and Definitions]

Overview of BACT and RACT

BACT is an emission limitation, based on the maximum degree of reduction for each pollutant, subject to regulation under the Clean Air Act, which would be emitted from any proposed stationary source or modification, which MCAQD, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combination techniques for control of such pollutant.

1. Under no circumstances shall BACT be determined to be less stringent than the emission control required by an applicable provision of the Maricopa County Air Pollution Control Regulations or of any State or Federal laws, which include the EPA-approved State Implementation Plan (SIP).
2. If MCAQD determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation, and shall provide for compliance by means which achieve equivalent status.
[Maricopa County Air Pollution Control Regulations Rule 100-General Provisions and Definitions]

BACT applies to new or modified sources.

BACT applies to a new source, which is a source that exists after July 13, 1988, that has the potential to emit any of the following emission threshold limits:

- a. 40 or more tons per year of volatile organic compounds; or
- b. 40 or more tons per year of nitrogen oxides; or
- c. 40 or more tons per year of sulfur dioxide; or

- d. 15 or more tons per year of PM₁₀; or
 - e. 100 or more tons per year of carbon monoxide; or
 - f. 10 or more tons per year of PM_{2.5}; or
 - g. 0.3 or more tons per year of lead.
2. BACT applies to a modified source, if the source has an MCAQD air quality permit and proposes to make a physical change in or a change in the method of operation which increases the actual emissions of any regulated air pollutant emitted or which results in the emission of any regulated air pollutant not previously emitted. An increase in emissions is determined by comparing the source's potential to emit before and after the modification.
- a. Once a source has been permitted, any proposed modifications to the source may be subject to BACT requirements, if the proposed modification (not the entire source) causes an increase in the source's potential to emit in any one of the following amounts:
 - (1) 40 or more tons per year of volatile organic compounds; or
 - (2) 40 or more tons per year of nitrogen oxides; or
 - (3) 40 or more tons per year of sulfur dioxide; or
 - (4) 15 or more tons per year of PM₁₀; or
 - (5) 100 or more tons per year of carbon monoxide; or
 - (6) 10 or more tons per year of PM_{2.5}; or
 - (7) 0.3 or more tons per year of lead.
 - b. BACT applicability is evaluated for each individual modification and only applies to the source(s) being modified.
 - c. An owner or operator of a source is not allowed to circumvent BACT requirements by dividing the modifications into separate permit applications. The burden of proof to show that an application for a permit or permit revision is not being submitted as a phase of a larger project shall be upon the applicant.
 - d. An owner or operator may accept legally- and practically-enforceable limits on their operation in order to restrict emissions below the BACT thresholds and avoid the imposition of BACT. However, at such time as the applicability of any requirement in the Maricopa County Air Pollution Control Regulation Rule 241 (Minor New Source Review (NSR)) would be triggered by an existing source, solely by virtue of a relaxation of any enforceable limitation on the capacity of the source to emit a pollutant, then the requirements of Rule 241 will apply to the owner or operator of the source in the same way they would apply to a new or modified source otherwise subject to Rule 241.

RACT is the lowest emission limitation that a particular source is capable of achieving. RACT is required on existing sources in areas that are not meeting national ambient air quality standards (i.e., nonattainment areas).

1. For facilities subject to the Maricopa County Air Pollution Control Regulations, Regulation III (Control of Air Contaminants), RACT is the emissions limitations that are applicable to an emission unit at the time the permit is issued.
2. For facilities not subject to Maricopa County Air Pollution Control Regulations, Regulation III (Control of Air Contaminants), RACT is the lowest emission limitation that a particular source is capable of achieving by the application of control technology that is reasonably available considering technological and economic feasibility. Such technology may previously have been applied to a similar, but not necessarily identical, source category.
3. RACT for a particular facility, other than a facility subject to Maricopa County Air Pollution Control Regulations Regulation III (Control of Air Contaminants), is determined on a case-by-case basis, considering the technological feasibility and cost-effectiveness of the application of the control technology to the source category.
[Maricopa County Air Pollution Control Regulations Rule 100-General Provisions and Definitions]

RACT applies to all new sources, which are sources that exist after July 13, 1988, or modified sources, until the emission level reaches the appropriate BACT emission threshold limit(s).

1. The rules in Maricopa County Air Pollution Control Regulations, Regulation III (Control of Air Contaminants) are considered RACT requirements.
2. An owner or operator of a source must comply with the rules in the Maricopa County Air Pollution Control Regulations and, for the purposes of BACT and RACT, the rules in Regulation III (Control of Air Contaminants).
3. MCAQD is responsible for making the final determination of compliance with the RACT requirements.
4. Even if an owner or operator of a source is not subject to any rules in Maricopa County Air Pollution Control Regulations, Regulation III (Control of Air Contaminants), an owner or operator may be subject to RACT. MCAQD makes this determination on a case-by-case basis, considering the technological feasibility and cost-effectiveness of the application of the control technology to the source category.

Determination of Emissions Level

1. The owner or operator of a source must present an emissions analysis in order to determine whether the future emissions increase will trigger BACT requirements.
2. The increase in emissions (future PTE minus current PTE) must be calculated using the potential to emit for each new source or modification to an existing source.
3. For a new, stand-alone unit, the emissions increase is the PTE of the subject unit or the allowable emissions, as agreed by the owner or operator of the source.

4. For a limited modification of an existing source, the potential emissions increase is calculated for the unit alone.
5. If the modification is linked closely to other existing areas of the source, the emissions need to be evaluated for all of the affected existing areas of the source.
 - a. The modification must have a direct relationship to increased emissions in other areas of the source (e.g., by a debottleneck effect or if the modification can increase the utilization of another process line).
 - b. The owner or operator of the source must show an analysis by quantifying the emissions increase in the entire affected area due to the modification.
6. The increase in emissions must be calculated by comparing the difference in emissions from the PTE before the modification to the PTE after the modification.
7. The PTE may be substituted by new, allowable emissions if the terms of the enforceable permit conditions are agreed to by the owner or operator of the source.
8. The fugitive emissions (i.e., emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening) cannot be considered in determining whether the source is subject to RACT or BACT, unless the source belongs to one of the categories listed below. To the extent fugitive emissions are quantifiable, fugitive emissions must be included when determining potential to emit and when determining potential to emit before and after a modification.
 - a. Coal cleaning plants with thermal dryers;
 - b. Kraft pulp mills;
 - c. Portland cement plants;
 - d. Primary zinc smelters;
 - e. Iron and steel mills;
 - f. Primary aluminum ore reduction plants (with thermal dryers);
 - g. Primary copper smelters;
 - h. Municipal incinerators capable of charging more than 250 tons of refuse per day;
 - i. Hydrofluoric, sulfuric, or nitric acid plants;
 - j. Petroleum refineries;
 - k. Lime plants;
 - l. Phosphate rock processing plants;
 - m. Coke oven batteries;
 - n. Sulfur recovery plants;
 - o. Carbon black plants using the furnace process;
 - p. Primary lead smelters;

- q. Fuel conversion plants;
 - r. Sintering plants;
 - s. Secondary metal production plants;
 - t. Chemical process plants, which shall not include ethanol production facilities that produce ethanol by natural fermentation included in North American Industry Classification System codes 325193 or 312140;
 - u. Fossil-fuel boilers, or combinations thereof, totaling more than 250 million British thermal units (Btu) per hour heat input;
 - v. Petroleum storage and transfer units with a total storage capacity more than 300,000 barrels;
 - w. Taconite ore processing plants;
 - x. Glass fiber processing plants;
 - y. Charcoal production plants;
 - z. Fossil fuel-fired steam electric plants and combined cycle gas turbines of more than 250 million Btu per hour rated heat input; and
 - aa. Any other stationary source category which, as of August 7, 1980, is being regulated under Section 111-Standards of Performance for New Stationary Sources of the Act or under Section 112-National Emission Standards for Hazardous Air Pollutants of the Act.
9. If the owner or operator of a source asserts that a proposed modification is below the BACT emission threshold limits, the owner or operator must include in their permit application a summary of all prior modifications within the last five years.
- a. The owner or operator must demonstrate that the proposed modification is not part of a larger project that would be subject to BACT.
 - b. The owner or operator cannot circumvent BACT requirements by submitting permit applications in phases. The burden of proof is on the owner or operator to show that a permit application is not being submitted as a phase of a larger project.
 - c. Emission increases from all modifications must be documented by the permit engineer as part of the Permitting Division technical evaluation.

Top-Down BACT Analysis

1. The owner or operator of the source, not MCAQD, must conduct a top-down BACT analysis for each pollutant that exceeds the BACT emission threshold limits.
2. Once BACT is triggered, the owner or operator has the responsibility to research control options on a nationwide basis and to present a complete top-down BACT analysis for review and approval by MCAQD.
3. The selection of BACT should address the control of each emission point for the subject pollutant at the source or at the affected area in the case of a modification.

4. The owner or operator must document all of the following in the top-down BACT analysis:
 - a. Identify, for the emissions unit in question, all available control options.
 - b. Rank in descending order of effectiveness air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation.
 - c. Eliminate technically infeasible options.
 - d. Show, based on physical, chemical, and engineering principles, the technical difficulties of the control options with respect to the source-specific or emissions unit-specific factors that would preclude the successful use of the control options for the emissions unit under review.
 - e. Rank all remaining control options not eliminated due to technical infeasibility and list in order of overall control effectiveness for the pollutant under review, with the most effective control option at the top.
 - (1) Prepare a separate list for each pollutant and for each emissions unit subject to the BACT requirements.
 - (2) The list should present the array of control alternatives and should indicate the effectiveness of each alternative.
 - (3) The list should indicate if the alternative has been achieved in practice for the class and category of source in question.
 - f. Eliminate from consideration, upon approval by MCAQD, control options that are not cost effective by using the Annualized Cost Method:
 - (1) Calculate an equivalent annual cost from a capital cost using a capital recovery factor.
 - (2) Determine annual operating cost (e.g., labor, fuel, maintenance, and utilities).
 - (3) Calculate the total annual cost by summing the equivalent annual control equipment cost and the annual operating cost.
 - (4) Calculate the control cost by dividing the total annual cost by the tons of pollutants controlled per year.
 - g. Select the top-ranked control technology as BACT, unless it is demonstrated and MCAQD concurs that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not achievable. If the most stringent technology is eliminated, then the next most stringent alternative must be selected.

Alternative to Top-Down BACT Analysis

1. To streamline the BACT selection process, MCAQD will accept BACT control technology for the same or similar source category as listed by the South Coast Air Quality Management District (SCAQMD), San Joaquin Valley Air Pollution Control District (SJVACD), or the Bay Area Air Quality Management District (BAAQMD), or other regulatory agency accepted by MCAQD as a viable alternative.
2. If an owner or operator of a source opts to select control technology for the same or similar source category accepted by the air quality management districts in California, the owner or operator may forego conducting the top-down BACT analysis.

Applicability of BACT Control to Less Effective Emissions Points

1. BACT control must apply to all emissions points of the triggering pollutant emitted from the new or modified emissions unit.
2. If the overall cost to control every emissions point becomes prohibitive, the owner or operator of the source must include calculations in the top-down BACT analysis to justify whether the elimination of certain emissions points make the project feasible.
3. MCAQD will take the cost effectiveness value under consideration in determining whether emissions points can be eliminated from the overall BACT control system.
4. The formula of “The Cost Effectiveness Analysis for the Uncontrolled Portion” is shown in the following equation:

$$V = \frac{W - X}{Y - Z}$$

Where:

V = Dollars per ton (uncontrolled portion) of pollutant

W = Annualized cost of controlling all emissions points

X = Annualized cost of controlling the selected emissions points

Y = Total tons removed from all emissions points

Z = Tons removed from the selected emissions points

BACT Implementation Plan

1. The owner or operator of the source must prepare and submit a BACT Implementation Plan for MCAQD approval.
2. The BACT Implementation Plan must include the following information:
 - a. Individual emissions calculations for each emissions point that contributes to the BACT emission threshold limits

- b. Identification of all emissions points to be routed to the control system
- c. Justification for the elimination of emissions points from control
- d. Top-down BACT analysis or alternative control analysis
- e. Expected effectiveness of the selected control in terms of emissions capture and destruction or control efficiency
- f. Process design parameters for the control device
- g. Control device installation plan and timeframe

Section Two – Coming Soon

Section Three – Coming Soon

Section Three – Coming Soon

Section Four – Coming Soon

Section Five – Coming Soon

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Section Seven – Coming Soon

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